SUBJECT: INTERIM REPORT ON AEROMEDICAL PROTECTIVE EQUIPMENT

19 May 62

This report is an attempt to give in summarized, narrative, but preliminary form the description of the functions and current status of all the environmental control, escape and survival systems for the program concerned. A subsequent report will concern itself in more detail with the actual production specifications, production dates, and unit costs. The systems are divided into their component parts thusly:

I. Ship-Mounted Pneumatic and Oxygen Controlled Equipment:
   - A. Oxygen Control Panel Assembly
   - B. Disconnect Assembly, Suit Ventilation
   - C. Bracket Support, Vent Valve
   - D. Indicator, Oxygen Overboard
   - E. Valve Assembly, Filler
   - F. Disconnect Assembly, Oxygen, Dual
   - G. Gage, Dual, High Pressure (0-2000
   - H. Pressure Reducer and Oxygen Cylinder Assembly
   - I. Valve Assembly, Self-Checking
   - J. Cylinder, High Pressure
   - K. Warning Light, Depleting Oxygen Supply Pressure
   - L. Bracket Support, Pressure Reducer
   - M. Clamp
   - N. Valve Assembly, Suit Ventilation
   - O. Pressure Reducer Assembly.

II. Suit, Full Pressure
   - A. Helmet Assembly
   - B. Helmet
   - C. Regulator, Oxygen, Dual
   - E. Exhalation Valve, Single
   - F. Garment Assembly, Full Pressure
   - G. Garment
   - H. Mounting Ring
   - I. Deflector
   - J. Mounting Hardware
   - K. Disconnect
   - L. Suit Controller, Oxygen, Dual
   - M. "O" Ring
   - N. Disconnect (undersuit)
   - O. Hose Assembly, Suit Controller
   - P. Hose Assembly, Suit Controller

III. Maintenance Van
   - A. Basic Van
   - B. Altitude Chamber
   - C. Test Stand

F. Bio-medical Instrumentation
G. Oxygen Manifold

IV. Transport Van
A. Basic Van
B. Ventilation Console
C. Pilot Console
D. Oxygen Manifold
E. Suit Test Kit
F. Ventilation Pack
G. Breathing Pack
H. Auxiliary Power Unit
I. Intercom System
J. Pilot Chairs

V. Ready Room
A. Lounge Chairs
B. Ventilation Console
C. Intercom System
D. Pilot Console

VI. Escape System - Ejection Seat and Parachute Assembly
A. Ejection Seat
B. Actuator Pack
C. Parachute Pack
D. Drogue Release
E. Pad, Kidney Support

VII. Emergency Oxygen System

VIII. Seat Pans, with Survival Kit

In accordance with over-all program philosophy, a basic design concept has been complete duality of function. This includes the dual breathing regulator, dual suit controller, complete duality in the panel-mounted oxygen control unit, ship's oxygen supply, as well as support hardware such as disconnects, lines, controls, and emergency oxygen supply.

Qualification testing of the oxygen system components consisted of a series of functional tests performed before, during and after environmental testing of the oxygen package.

I. Ship-Mounted Pneumatic and Oxygen Controlled Equipment - all qualified, with the exception of the oxygen control panel assembly and the disconnect assemblies.

A - Oxygen Control Panel Assembly - presently this is a soft-seat assembly. Plans are being made to change over to a hard-seat assembly, primarily as a result of a recent on-board aircraft fire, (not related to this program). This change will require field retro-fit and will require re-qualification. The ship's oxygen control panel assembly is mounted at a convenient location on the left-hand side of the cockpit console. The panel, completely dual, consists of two oxygen supply "On-Off" valves and two low pressure gages enclosed in a single housing. The "On-Off" valves provide flow/no flow control of the ship's supply of oxygen from the oxygen supply cylinder-reducer assembly through suitable tubing to the ship's quick disconnect. The "On-Off" valves also provide the crew member with a secondary oxygen supply depletion-balance control; i.e., if one of the supply cylinders shows an excessive depletion rate, as compared to the other supply cylinder, the reducer in the rapidly depleting system can be turned off until the pressures in both systems are equal. The primary depletion control is automatic, but may vary due to some slight mechanical condition. The low pressure gages, connected independently to the low pressure outlet side of the high pressure reducers, provides a direct reading of the oxygen pressure delivered to the helmet regulator.

B - Disconnect Assembly, Suit Ventilation - requires possible change-over to a spring-loaded probe device because of anticipated difficulties with the seat pack rolling over and forward upon ejection and preventing the man from successfully leaving the aircraft in the event of emergency ejection. This will require re-qualification. The ventilation disconnect, an integral part of the vent system is mounted on the crew member seat, and provides automatic separation from the suit vent system. Vent system separation occurs automatically during pilot normal "stand-up" movements for ground emergency evacuation and automatic lanyard controlled separation occurs during in-flight emergency seat ejection. A check valve is incorporated into the suit half of the disconnect to prevent loss of suit pressure at disconnect separation and also acts as a water check valve.

C - Bracket Support, Vent Valve - qualified. This is attached to the seat, to hold the ventilation hose in position relative to the seat.

D - Indicator, Oxygen Overboard - qualified, contains a disc which will blow if the burst disc blows, to prevent internal rupture and/or contamination of the oxygen system.

E - Valve Assembly, Filler - qualified. This assembly is used in servicing the ship's oxygen bottles.

F. Disconnect Assembly, Oxygen, Dual - requires possible change-over to a spring-loaded probe device and will require re-qualification. Oxygen from the ship's supply is conducted through the "On-Off" valves to the ship's supply. The disconnect is presently mounted at a position on the front of the crew member's seat, permitting ease of personal oxygen hose attachment and allowing vertical seat adjustment. However, because of considerations referred to in (B) above, possible changes are anticipated. Presently, attachment of the personal oxygen leads or hoses to the oxygen disconnect assembly is accomplished by simple alignment of the leads to the disconnect and pressing into place. Engagement of the leads into the disconnect mechanically locks them into this position and automatically opens a check valve in the disconnect allowing the oxygen to flow to the suit controller. This check valve cannot close and cut off oxygen supply except by separation of leads from the disconnect. Manual disconnect separation can be accomplished by pulling up on the oxygen leads. A pull of approximately thirty pounds is required. The disconnect is also equipped with a lanyard operated separation mechanism. By attaching the lanyard to convenient aircraft structure, the ejection of the seat during emergency aircraft abandonment will automatically separate the crew member from the oxygen disconnect and ship's oxygen supply. Check valves incorporated into the crew member's personal oxygen leads automatically close to prevent loss of emergency oxygen through the separated leads. The ejection bailout action reacts upon a guided cable to the emergency oxygen system, causing the emergency oxygen to be turned on providing the crew members with an uninterrupted supply of oxygen.

G. Gage, Dual, High Pressure - qualified. The dual high pressure gage is connected independently to the inlet side (high pressure) of the oxygen high pressure reducers and provides a direct reading of the pressure of oxygen stored in the supply cylinders. The dual high pressure gage is enclosed in a single housing and is mounted on the left-hand side of the cockpit instrument panel.

H. Pressure Reducer and Oxygen Cylinder Assembly - qualified. The two high pressure oxygen reducer valver, connected independently to the oxygen supply cylinders, reduces the outlet pressure of the supply cylinders from the stored pressure of 2000 PSI (max) to a minimum delivery pressure of 66 PSI at 100 LPM flow. Flow passages and arrangements of internal parts are such as to maintain delivered pressures without appreciable pressure drop during any conditions of demand, including maximum obtainable flow volume of the helmet breathing regulator. The contractor has been asked to place an "on-off" valve on the reducer for re-filling purposes. Requalification is not required.

I. Valve Assembly, Self-Checking - qualified: mounted to the reducer and screws into the oxygen bottle. A safety burst disc is incorporated into the outlet port of the oxygen supply cylinders.

The disc serves as a maximum pressure relief valve to prevent a hazardous pressure build-up in the supply cylinders due to an abnormally high temperature condition.

J. Cylinders, Oxygen, High Pressure - qualified. The oxygen supply is contained in two stainless steel cylinders with a single cylinder volume equal to 875 cu. in. (1750 cu. in. total capacity, 2 cylinders), and a service pressure of 2000 PSI at 70° F. Only one bottle has been proof tested by the contractor to date. These bottles are not shatter-proof to gun-shot.

K. Warning Light, Depleting Oxygen Supply Pressure (Switch, High Pressure - qualified. Two red warning lights connected through two pressure sensitive switches to the oxygen supply cylinders will turn on the warning lights whenever the stored oxygen pressure in either cylinder decreases to 400 PSIG. The warning lights are mounted on the main instrument panel in the cockpit.

L. Bracket Support, Pressure Reducer - qualified.

M. Clamps - qualified

N. Valve Assembly, Suit Ventilation - qualified. Thermal protection is provided by the controlled flow of ventilation gas through the suit. The ventilation control valve, mounted on the left-hand console, is a variable flow valve enabling the pilot to manually adjust the flow of ventilating gas from the ship's supply to the suit.

O. Pressure Reducer Assembly - qualified. A spring-loaded relief valve is installed on each reducer. Its function is to prevent excessive pressure build-up in the system due to leakage across the reducer valve when the system is not in use. The valve is set to relieve at a pressure between 120 and 140 PSIG.

II. Suit, Full Pressure: none of the suit hardware has been qualified, although the suit and its componnents are considered in good operational condition, and in its entirety qualified by similarity. The suit system, together with the conditioning system, will maintain thermal and respiratory balance for the pilot and provide emergency protection against extremely high temperatures, wind blast and decompression. During normal flight, the suit is not pressurized and not restrictive to movement. The suit ventilation system maintains comfort under the gas-tight and insulated clothing assembly. If a decompression situation should occur, the suit offers complete pressurization while ventilation and thermal protection continue unchanged. Movements will be somewhat limited when the suit is pressurized but not enough to hamper necessary actions of the pilot. Altitude chamber runs, simulating mission profiles of temperature extremes as well as altitude limits, have been used in the sophistication and preliminary qualifications of the suit.

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The suit controller is a combination high-flow, low-resistant valve provided to regulate and maintain suit pressure. The vent section of the valve uses a compensation diaphragm and aneroid controlled back-pressure to maintain absolute suit pressure. The suit controller, mounted on the right hand side of the suit, is a completely dual unit, enclosed in a single housing. The controller automatically maintains these constant absolute suit pressures: primary system - 180 mm Hg.; secondary system - 170 mm Hg.; subject to variations in pressure permitted for ventilation and allowable suit leakage, whenever an atmospheric pressure of 170 mm Hg. or less is reached. The controller maintains the necessary suit pressure by controlling the back pressure of the ventilating gas. If the vehicle ventilating gas supply system becomes inadequate or is lost, the demand section of the suit controller will automatically supply gas pressure directly into the suit from the oxygen supply system. The normal aircraft oxygen supply and the emergency supply systems are connected to the suit controller to insure suit pressurization under all flight conditions. A water check valve is provided in the controller to prevent the flow of water into the suit when submerged in water.

The oxygen flow tester is an integral part of the suit controller. It can be readily reached with either hand and is so designed to minimize its unintended operation by hand or arm movements. The manual oxygen flow tester enables the crew member to in-flight or ground check the suit controller operation. The press-to-test is activated by pressure of the crew-man's finger; the result of this action is to create artificially a demand condition within the controller corresponding to that which would be encountered at high altitude.

The action causes suit pressurization and a corresponding increase in oxygen flow to the helmet regulator.

The breathing regulator, mounted inside the helmet, is a dual demand type regulator actuated by a spring-loaded diaphragm that is referenced to the suit pressure to maintain a positive breathing pressure over any given suit pressure. The regulator supplies the pilot with breathing oxygen from the ship's system during normal operation and from the emergency oxygen supply during any emergency requirements. A variable orifice is incorporated into the dual regulator to facilitate equal depletion of the dual ship supply or dual emergency supply of oxygen.

TEST SCHEDULE
FOR FIRST FULL PRESSURE SUIT

JULY 6, 1960:	27000 ft. Flow vs. Pressure Differential Check 42000 ft. Flow vs. Pressure Differential Check Preliminary examination of subject under heat load at 27,000 feet.
WEEK OF 7-11-60:	David Clark to refit helmet to provide more comfort for [redacted]. 25X1 [redacted] to David Clark Company 7-14 and 7-15 for refit of helmet. 25X1 David Clark to investigate smaller under suit oxygen hoses.
WEEK OF 7-18-60: MONDAY:	one-half day for recheck of entire equipment assembly.
TUESDAY:	Ground functional check and altitude functional check.
WEDNESDAY:	First full profile heat run.
WEEK OF 7-25-60: MONDAY & TUESDAY:	Two additional full profile heat runs.
WEEK OF 8-1-60: WEDNESDAY, THURSDAY & FRIDAY:	Test runs outside normal profile.
WEEK OF 8-8-60: MONDAY & TUESDAY:	Additional tests outside normal profile.
WEDNESDAY:	Water emersion in swimming pool.
WEEK OF 8-29-60: MONDAY:	Cockpit mockup checkout at vehicle contractors. Suit pressurized and unpressurized.
WEDNESDAY, THURSDAY & FRIDAY:	Jump tests at El Centro.

Test Schedule for
First Full Pressure Suit

WEEK OF 9-5-60:	Additional jump tests at El Centro.
WEEK OF 9-12-60: MONDAY:	Explosive decompression tests at Edwards.
WEEK OF 9-29-60:	Return to Firewel for Recirculation System tests both normal profile and selected outside of profile test runs.
WEEK OF 10-2-60:	Cold altitude tests preferably to be run at Cornell Laboratories.
WEEK OF 10-9-60:	Cold water emersion test (40 to be run at Firewel using Bio-Medical Instrumentation).

The suit will be available after the middle of November for the scheduling of sled tests and ejection tests.

LIFE SUPPORT SYSTEM

General

Simply stated the Life Support System controls and delivers oxygen and ventilation to the pilot. I think everyone here knows that the oxygen system is dual with full redundancy. Basic system concept was that failure of any one oxygen system component would allow return of the aircraft from any point of the mission.

Legend Board

We generally regard the overall system as consisting of four (4) sub-system areas:

Oxygen High Pressure
Oxygen Low Pressure (including suit gear)
Oxygen Emergency
Vent Air Assembly

Schematic Board

Quickly trace each system area on the chart

Point out there is no direct pneumatic or connection between the dual system.

Performance Development

All components and sub-systems have been qualified to the original requirements and some to periodic changes in requirements. We have recently requalified the high pressure oxygen sub-system components from 2800 PSI to 3000 PSI.

The only modification required was altering of the delivery pressure schedule. This can be accomplished as a field modification. We have made our first shipment of high pressure reducers to the Depot last week.

On most all components there have been minor local changes or improvements handled on a weekly or daily basis between our technical people at the area and engineers at our plant. Records kept by our technical reps on component and system performance have been of great value in pointing out changes necessary to avoid possible problem areas. Many of the changes have come as suggestions from vehicle contractor engineers during the development and test stages. Whenever a change was of a magnitude to alter basic concept requalification was run.

At the present time there are several changes being made and several under consideration.

(1) Panel night <u>light intensity</u>

(2) High Pressure <u>Gage dial face</u>

(3) Vent Hose Assembly <u>requirement change</u>

These areas are not considered to be of major magnitude. There is remedial action on all with resolution expected in the next few weeks.

Problem Areas

The two principle problem areas unresolved are:

Oxygen capacity and system balance - They are related but we will discuss them separately.

Problem & Legend Card

Oxygen Capacity is a problem as flight test and training usage experienced has been greater than originally anticipated in sizing system capacity. At present, the oxygen supply consists of two (2) 1100 cubic inch cylinders, one in each of the dual systems. Original concept sized the cylinder capacity to supply oxygen for the first half of the mission from both and the return half from a single in event of an oxygen system failure.

O_2 Chart

The oxygen chart shows the mission range attainable at different usagerates.

25 LPM-USAF USN reccommended FPS capacity

18-19 LPM-Nominal average field test

11-13 LPM-Nominal average indoctrination chamber

Adding the recommended allowance of 44% (WADDTR 60-106) for increased usage due to piloting an aircraft to the 13 LPM gives a value of 18.7 LPM comparing favorably with the nominal 19 being realized on field test and training.

Problem Area Legend Card

We had several subjects for indoctrination who ran 15 - 17 LPM this would give a nominal consumption rate of 22 - 24 LPM.

While these experience numbers appear to agree with service usage rates and specifications the oxygen supply remains a problem area.

Improvement Areas --

1) Greater Supply: We have already increased the cylinder supply from 875 to 1100 cubic inches and raised the nominal supply pressure from 1800 to 3000 PSI. This is a total % increased from the original parameters. However, 2 - 2-1/2 hours have been added to the mission profile from the original.

2) Accept lower parameters from experience: The actual consumption rates quoted are taken flight of from 1 - 1-1/2 hours duration. This short time span included take-off, landing and particular manuevers such as refuel. These are high mental and physical demand periods resulting in higher oxygen demand. It is not too unlikely for oxygen rate to drop for longer flight periods.

3) Minimize non-breathing oxygen usage

A) Suit Area -- Regulator Sensitivity
Exhalation Valve
Suit Controller Back Pressure
Helmet Face Dam

Vehicle Area -- Vent Air Flow Regulator
Modification of Suit Flow Valve

B) System Balance

Balance or equalization of supply pressure is necessary to insure oxygen availability for safe return inevent of failure of one system. As mentioned earlier the cylinders are sized to fly the first half of the mission on both and return on one from maximum mission radius.

1) Normal Flow Unequal

Ideally the systems should be self balancing as the high supply cylinder gives the lower outlet or system pressure. The design of the helmet regulator is such that the lower inlet pressure dide should open first as theoretically the lower the inlet pressure the quicker the valve should open. Hoever, this has not proven out. There has been no predictable relationship between the sides of the dual regulator and inlet pressure. There are two many factors of tolerances, function, assembly to control in the regulator and reducer for the system to produce equal flows.

2) Equalizer Device Necessary

Air added component is r3quired to control flow. and equalize pressure in the supply cylinders. We have made many approaches to this seeming simple problem over the past year. Our initial efforts were centered on controlling system flow by sensing system or low pressure. No results were positive until we picked up our control signal from the storage cylinders.

3) Equalizer Valve Functionally Developed

During the past four to five months using the direct sensing method from the cylinder we have built and successfully tested two different models of an equalizer. Balance is maintained at a difference of under 100 PSI. While we sense the storage cylinders pressure direct the valve does not have high pressure in it as an orifice reduction is used for the control pressure.

a) Packaged to mount on panel. Design change required for port orientation and reduction of size to meet envelope limits.

b) Manual over-ride incorporated. Panel mounting has simplified adding a manual over-ride. The over-ride dumps the control pressure causing the valve to return to the neutral position.

4) Alternates

There are alternate means of insuring availability of oxygen for return from maximum operation radius. Equal flow from the parallel systems is not an absolute requirement. The absolute requirement is return oxygen.

1) Hand balancing by the pilot was rejected by as unnecessarily adding to the pilot work load.

2) Intermittent monitoring by differential pressure instrumentation warning. This would require pilot to switch valves upon signal light.

3) Programmed single system operation could be used where the pilot would have to make only one hand adjustment over the mission. A signle system and supply would be used for the first quarter of the mission. At that point, by time program and signal light, the pilot will switch over to the other system. At maximum mission range he will used 1/3 of each cylinder supply leaving 2/3 in each of the cylinders to return. There will be no cause to make a further hand switch unless there is a failure in the system being used.

MEETING NOTES

Thursday, January 3rd, 1963

STATINTL

THOSE PRESENT: [redacted]

We discussed principly the General's Interim Report on Aeromedical Protective Equipment dated 19 May 1962. Several deletions were made from the list of hardware according to changes we have gone under in the past seven months. Items of discussion included the oxygen control panel, ventilation disconnect assembly, oxygen dual disconnect, the high pressure oxygen reducer, the high pressure oxygen cylinder, breathing regulators and the pressure suit. The General requested that we send him additional information on the above items as to changes and improvements affected over the past seven months as he would like to bring his report up-to-date.

We discussed the oxygen consumption problem relating the experience and usage factors encountered on our Indoctrination Program as to those on the Flight Test Program. The physical and mental activity levels are quite different. We informed the General we will be initiating our 'in-house' consumption studies the week of January 14th in which we will attempt to duplicate the head motions of the drivers. We requested Harry Collins to schedule [redacted] for consumption test studies the week of January 14th. STATINTL

The length of time spent here by the Subjects for the Indoctrination Program was discussed. It was agreed that the present schedule, as established, should be adhered too. The General will press this point in his circles.

We briefly discussed with the General some of the factors bearing on the pressure spread between the dual oxygen systems. STATINTL [redacted] is insistent that we maintain identical pressures in each supply cylinder. Experience has indicated this is highly impractical if not impossible. While taking no firm position, the General did seem to indicate that a working tolerance in the range of 100 to 125 psi difference at the high point or 4-1/2 to 5-1/2 hours should be acceptable.

Meeting Notes
January 3rd, 1963

The day of the meeting we received from [redacted] the official schedule on the increase of system pressure from the nominal 1800 psi to 2500 psi. Copies of [redacted] letter were given to the General. We discussed some of the change requirements for this requested change.

We discussed the possibility of going to a stainless steel lined fiber glass cylinder for oxygen supply. The General requested that we investigate this feature and supply him estimates for an exploratory development program for the stainless steel lined fiber glass cylinder for the main ship supply as well as the emergency supply. Also to be included in this program are the parachute back pans presently of welded aluminum construction. The General suggested that we have our materials specialist, [redacted] make personal visits to both Riverside Plastics and Lamtex to initiate this program. The General said that if the probability of success looked good we can get special funding from the project for this effort.

The General was asked to expedite the approval to proceed with the additional ground support equipment as requested of [redacted] on November 19, 1962.

[redacted]

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December 19, 1962

MEMO FOR RECORD

STATINTL Telecon - [redacted] - December 14, 1962

(1) Is locking loop on main quarter bag to have cotton buffer on locking loop?

(2) Drogue Riser not sewn far enough down at male drogue link to retain cotton buffer on one pack.

(3) Main power ripcord housing not hand tacked to nylon pan pouch at point housing passes through pouch.

(4) The second row of stitching on seam, joining side and top, of the side flap on main pack is right on edge of fabric and is doing little or no good. This appeared on the flap only on one pack.

(5) Quick release snaps for breast and leg straps should be otterbine rather than Forge craft because of previous bad experience in test units at El Centro. They would not eject the mating hardware.

(6) Retaining straps in pack, for stowing main risers, located at the connector links should be moved up 1 1/2 inches to allow more slack in risers outside the pack.

(7) Retaining loops, inside wing flaps, for oxygen hoses to be 2 3/8 inches from center of male snap to center of female snap. One loop that retains both hose and green apple housing to be 3 inches from center to center.

(8) What is the tolerance on the alignment of the section seams at the radial seams?

(9) Force required to disengage green apple from housing shall be 5 pounds minimum on a straight pull.

(10) On two drogue releases out of four the chamfered roller and the square edged roller were interchanged.

(11) On the Drogue Release the small pin in the one link that keeps the linkage from overcocking was almost flush and not doing its intended job.

(12) On the male drogue release there was a burr from a Rockwell impression that might cause hang-up.

(13) Why wasn't new design on-off valve incorporated in these units?

(14) There were no separatiors between drogue deploy cable and drogue release cable inside actuator pan, to prevent possible snagging of release cable on deployment cable being actuated.

(15) One of the small drive screws in the arming knob that attaches the snap on ferrule to the plastic knob fell out.

A C T I O N

STATINTL

STATINTL (1) [redacted] asked about this. Neither [redacted] were aware of it. They will check with [redacted] to see if he knows anything about this.

STATINTL

STATINTL (2) To be repaired by [redacted] to inspect on all future units.

STATINTL

(3) To be accomplished by [redacted] to accomplish on futures

STATINTL

(4) To be repaired by [redacted] to inspect on futures.

(5) This is an Air Force standard part and is procured as such and may be made by any of several manufacturers. The Forge Craft Snaps that were troublesome were from a bad batch. The Forge Craft people were called in and it was found that a small tit from the forging had not been machined off and was causing the hang up. The entire batch was recalled and since this time there have been no instances of this trouble. [redacted] will endeavor to use otterbine when possible although there should be no objec@ tion to future use of Forge Craft Parts.

STATINTL

STATINTL (6) [redacted] to rework S/N 7 through 10 and all futures to be made to new location.

STATINTL (7) [redacted] to inspect S/N 7 through 10 and rework if necessary. All futures will incorporate this requirement.

STATINTL (8) [redacted] states that the tolerance they manufacture to is 2 inches maximum.

(9) To be incorporated on test procedure [redacted]

STATINTL

STATINTL

STATINTL (10) [redacted] to assembly properly. [redacted] note on future assemblies.

STATINTL (11) [redacted] to replace with a part from parachute S/N 3 or 4. [redacted] note on future assemblies

STATINTL (12) [redacted] to clean-up burr. [redacted] note on future assemblies.

STATINTL

STATINTL

(13) There has been no written design change request received to my knowledge.

STATINTL

(14) New piece to be added - [redacted] No written design change request received to my knowledge.

STATINTL

(15) Part procured from Air Force. [redacted] to replace arming cable with assembly from parachute S/N 3 or 4. [redacted] note on future assemblies.

STATINTL

STATINTL cc: [redacted]

November 12, 1962

STATINTL

TO: [redacted]

FROM:

RE: Modifications to be Made in Future Production Parachutes to Solve Malfunctions of Hi-C Test of 11-5-62

The following modifications were agreed upon by all persons at the meeting at [redacted] place, 11-7-62.

STATINTL

PERSONS PRESENT: [redacted]

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STATINTL

PACK AND HARNESS - [redacted] RESPONSIBILITY

1. Extend loop for leg snap around seat sling and kit retention strap and sew down to act as a keeper for kit retention strap.

2. Change bottom pack tie-down strap to one inch Type XI, Condition "R" webbing. Using suitable quick fit connector.

3. Use steel cones and teflon washers on both ripcords (main and drogue) use strongest thread possible to sew cones to pack.

4. Add 1-3/4 web wrap around on harness behind drogue pack to hold rear lift web from tearing off to side sewing to straddle top stiffener.

5. Quarter bag retaining cord to be zig-zag sewn to attaching point.

6. Trim wing flaps approximately 1-1/2 inches both sides.

7. Add wind blast flaps of 1-3/4 web on top and bottom of pack.

8. Use SST rivets to attach cone on base of pilot chute.

9. Add tab of 1-1/2 inch tape extending out to original point of wing flap for mounting arming knob.

[redacted]

November 12, 1962

Modifications to be Made in Future Production Parachutes to Solve Malfunctions of Hi-Q Test of 11-5-62

TIMER PAN - FIREWEL RESPONSIBILITY

1. Change bottom footman to be suitable for one inch webbing. Change material of footman to .060 SST, 1/4 hard.
2. Change cover to .040 Tk., 6061-T6 stock.
3. Add covers on arming mechanism observation ports.
4. Change Dzus fasteners to #8 nut plates.
5. Add a #8 nut plate in each top corner.
6. Extend cover to pick up center screw on upright flange and also two pack tie-in screws on each side.
7. Change slots for bungees to holes and use a rubber chassis plug to retain bungee in hole.
8. [redacted] to submit drawing on proposed "Z" section to support cover below drogue deploy timer.

STATINTL

STATINTL

TIMERS - [redacted] RESPONSIBILITY

1. Check with PSC on possibility of strengthening timer covers, either with use of heavier stock or rigidizing.

[redacted]

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STATINTL

cc: [redacted]

TRIP REPORT

 [redacted] November 20, 1962

Company Contacted: David Clark Company, Worcester, Massachusetts

People Present: [redacted] - David Clark
[redacted]id Clark

The purpose of the meeting was to test new design flotation gear for DN 501 00-1 Full Pressure Suit. [redacted]   [redacted] donned suit at David Clark in the morning and various size cartridges were used to pressurize flotation gear, to determine maximum charge that could be utilized with comfort.

In the afternoon, in the pool, [redacted] wearing a full pressure suit and parachute pack, tried various size cartridges for flotation. A 24 gram charge allowed him to float too low in the water. A 28 gram charge proved slightly better. Finally a 31 gram charge was used and appeared to be satisfactory from both a flotation and comfort stand point. In all cases he encountered no difficulty boarding the life raft. This was accomplished with relative ease in approximately 15-20 seconds in order to remove the parachute harness. It was necessary to deflate floating gear slightly, so that the chest strap could be unsnapped. In actual usage this would not present a problem since he could cut the strap using the knife from his suit.

One additional modification is to be made to the flotation gear. The tube, used for oral inflation or deflation is to be increased to the size presently used on standard underarm flotation equipment. This is to change from approximately a 1/4 O.D. tube to a 7/16 O.D. tube. It was felt this change was necessary due to the amount of time necessary to deflate the equipment.

Numerous photos were taken of the pool test and [redacted] will supply copies to [redacted] and Firewel as soon as they are available.

[redacted]

JKS/sp

cc: [redacted]
File 6542-2